

## AMENDMENTS TO THE SPECIFICATION

Please amend the first full paragraph on page 4 as follows:

A number of methods have been devised for determining an indicator of the shape of a molecule or receptor, which can then be compared to other molecules of known shape to search for similarities or compliments. These methods have all met with limited degrees of success in their ability to accurately describe the shape of the molecules or receptors. One such computer program for designing biological molecules is ~~Perhaps the most popular ligand-based strategy that takes shape explicitly into account is~~ Comparative Molecular Field Analysis or COMFA™ a ~~product of Tripos, Inc. (CoMFA).~~ In COMFA™ ~~a CoMFA~~, the van der Waals and electrostatic fields of molecules are sampled over a grid superimposed on the molecule or receptor site. The values of these fields at the particular grid points are then used as descriptors in a regression model. COMFA™ ~~CoMFA~~ thus includes both molecular shape and polarity. While the COMFA™ ~~CoMFA~~ method can generally narrow a range of compounds to those which are generally similar, the COMFA™ ~~CoMFA~~ method has distinct problems in its application. In the first instance COMFA™ ~~CoMFA~~ uses a large amount of explicit information to encode shape, involving many grid points and geometric constraints. COMFA™ ~~CoMFA~~ also requires the inclusion of a overlaid gird on the molecule which generates questions of accuracy due to the effects of grid spacing and orientation of the molecules being compared.

Please amend the Abstract as follows:

~~Systems and~~ Methods related to the generation ~~use of~~ shape signatures ~~for compactly~~ representing molecular shape, and using shape signatures in both ligand-based and receptor-based molecular design. Ray-tracing is used to explore the volume interior to a ligand, or the

space exterior to a receptor site. Shape signatures are then probability distributions derived from the ray-traces. Shape signatures provide condensed descriptors of shape properties ~~can serve as compact descriptors of shape requiring modest storage space, and which may be quickly readily~~ compared to each other to test for shape similarity or complementarity.